

**ABSTRACT OF THE DISCLOSURE**

The complex mechanical gear trains and lubrication systems of conventional engine configurations are eliminated by using combinations of  
5 hydrodynamic air foil bearings, hydrodynamic solid geometry carbon seals/bearings, magnetic bearings, and electrical starter/generators that can also act as bearings to support the high speed shafts of gas turbine engines. The various bearing types and the starter/generators are arranged in such a way as to share peak loads experienced by the engine shaft during maximum  
10 aircraft maneuvers. This results in a minimal bearing and engine size.